The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte ANDREAS LEUPOLZ and WERNER SCHERBER

Appeal No. 2006-0037
Application No. 09/874,371

HEARD: FEBRUARY 7, 2006

Before GARRIS, McQUADE and BAHR, *Administrative Patent Judges*.

McQUADE, *Administrative Patent Judge*.

DECISION ON APPEAL

Andreas Leupolz et al. appeal from the final rejection (mailed June 22, 2004) of claims 1-12 and 15-22, all of the claims pending in the application.

THE INVENTION

The invention relates to "a method for improving thermal comfort in passenger airplanes . . . [and] to improved airplanes and improved interior cabin parts for airplanes" (specification, page 1). Representative claims 1, 18 and 20 read as follows:

1. A method of improving thermal comfort in a passenger airplane, the airplane having a cabin with interior surfaces, the airplane cabin for transporting one or more passengers, the method comprising:

applying a heat-reflecting coating with a thermal emission coefficient no greater than approximately 0.5 to at least one interior surface of a cabin of a passenger airplane,

whereby the coating provides improved radiation exchange with a passenger in the airplane cabin when compared with an uncoated interior surface.

18. An airplane improved for thermal comfort, the improved airplane comprising:

an airplane comprising an airplane cabin having interior surfaces,

a heat-reflecting coating with a thermal emission coefficient no greater than approximately 0.5 on at least one of the interior surfaces,

whereby the coating provides improved radiation exchange with a passenger in the airplane cabin when compared with an uncoated airplane cabin.

20. An airplane cabin part improved for thermal comfort, the improved part comprising:

a part for use in an airplane cabin having at least one surface which, when the part is installed in the airplane cabin, provides the at least one interior surfaces of the airplane cabin,
a heat-reflecting coating with a thermal emission coefficient no greater than approximately 0.5 applied to the surface,

whereby the coated surface, when the part is installed in the airplane cabin, provides improved radiation exchange with a passenger when compared with an uncoated surface.

THE PRIOR ART

The references relied on by the examiner to support the final rejection are:

Coleman	4,731,289	Mar. 15, 1988
Yoneda et al. (Yoneda)	5,976,702	Nov. 02, 1999
Rensch	6,092,915	Jul. 25, 2000
Allemand et al. (Allemand)	6,178,034	Jan. 23, 2001
Russell et al. (Russell)	6,391,400	May 21, 2002

THE REJECTIONS

Claims 1-3, 15, 17, 18 and 20 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Russell, and in the alternative under 35 U.S.C. § 103(a) as being unpatentable over Russell.

Claims 4-6, 8 and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Russell in view of Allemand.

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Russell in view of Coleman.

Claims 7, 16, 19, 21 and 22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Russell in view of Yoneda.

Claims 10-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Russell in view of Rensch.

Attention is directed to the brief (filed April 8, 2005) and answer (mailed June 14, 2005) for the respective positions of the appellants and examiner regarding the merits of these rejections.[1]

DISCUSSION

I. Grouping of claims

In the brief (see pages 3-5), the appellants have grouped together claims 1, 18 and 20, claims 2-4, claims 5-6, claims 7-9 and claims 10-12, respectively, and have not separately argued the patentability of any individual claim apart from the others in the same group. Thus, for purposes of the appeal, claims 18 and 20 stand or fall with claim 1, claims 3 and 4 stand or fall with claim 2, claim 6 stands or fall with claim 5, claims 8 and 9 stand

[1] Although the examiner's statement of the rejection based on Russell and Yoneda does not mention claims 19 and 22, the accompanying explanation clearly indicates that the omission was inadvertent.

or fall with claim 7 and claims 11 and 12 stand or fall with claim 10 (see In re Young, 927 F.2d 588, 590, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991); In re Wood, 582 F.2d 638, 642, 199 USPQ 137, 140 (CCPA 1978)).

II. The merits

Russell, the examiner's primary reference, pertains to visibly transparent, heat reflective thermal control films suitable for vehicular and architectural glazing applications. The vehicular applications envisioned by Russell include windows, windshields, windscreens, canopies, panes, and the like in vehicles such as automobiles, trains, boats, aircraft, and spacecraft, while the architectural applications include windows, viewports, skylights, panes and the like in domestic and commercial buildings (see column 1, lines 32-42). The following passage from the reference explains why thermal control films are used with glazing:

> [w]hile windows often enhance the aesthetics and functionality of buildings and vehicles, they can also cause undesirable gain or loss of heat. In warm climates, exterior heat may enter through windows, thereby increasing air conditioning loads. In cold climates, interior heat is lost through windows, thereby increasing heating demands. . . .
>
> Heat loss through a window may arise from a convective/conductive/emissive process, for example, where interior hot air raises the temperature of the glass, by convection, the thermal energy is distributed throughout the glass, by conduction, and some of the

thermal energy is emitted or radiated, by emission, to the exterior. Heat loss by emission can be ameliorated by reducing the emissivity of the window glass, for example, by introducing a low emittance or "low E" (for infrared) coating (which is typically a thin metal film). Emissivity or emittance refers to the propensity of a surface to emit or radiate radiation of a specified wavelength, and is quantified as the ratio of radiant flux per unit area emitted by body to that of a blackbody radiator at the same temperature and under the same conditions. Thus, a perfect blackbody has an emissivity of 1.0. Ordinary window glass has an infrared emissivity of about 0.84. Window glass with a "low E" coating has a much lower infrared emissivity, often as low as 0.15, and heat loss through such a window is greatly reduced.

Optical coatings have found widespread application in the field of glazing, particularly as a means to control heat loss and/or heat gain. In many applications, optical coatings are used to "block" the transmission of electromagnetic radiation (e.g., infrared radiation, visible radiation, ultraviolet radiation) to some degree. In some applications, it is desirable to block some or all of the electromagnetic radiation of a particular wavelength band while transmitting some or all of the electromagnetic radiation of another particular wavelength band.

Thus, in one [common] application, an optical coating is employed to substantially block infrared electromagnetic radiation while substantially transmitting visible electromagnetic radiation. Such optical coatings are often referred to as "heat mirrors," "hot mirrors," or "thermal control films." For glazing applications, it is usually desirable that these optical coatings also be substantially visibly transparent [column 1, line 61, through column 2, line 41].

Russell focuses on optical coatings made of dielectric films, but acknowledges that "[a] variety of materials have been used as optical coatings, and most of these materials can be broadly classed in two categories, those used for their intrinsic electronic properties (e.g., metals), and those used as optical interference films (e.g., dielectrics), and combinations thereof (e.g., metal-dielectrics)" (column 4, lines 3-8). According to Russell, thermal control coatings or films typically transmit most or all of the incident visible radiation, while reflecting most or all of the incident infrared radiation (see column 3, lines 47-50). In this vein, the dielectric coatings favored by Russell are highly transmissive with respect to visible radiation, at least 50% to more than 90%, and highly reflective with respect to infrared (heat) radiation, at least 50% to more than 90% (see, for example, column 5, lines 43-54; and column 26, lines 16-54). Russell also teaches that the reflection characteristics of the films depend on, among other things, their thicknesses (see, for example, column 4, lines 19-33; column 10, lines 6-15; and column 23, line 36, through column 25, line 20), and that the films may be applied to different types of glazing assemblies including single pane constructions wherein the film is adhered to one of the faces of the pane, and double pane constructions wherein the film is disposed between, and

either adhered to or spaced from, the inside surfaces of the panes (see column 6, line 56, through column 7, line 5).

With regard to the 35 U.S.C. § 102(e) rejection of claims 1-3, 15, 17, 18 and 20, anticipation is established only when a single prior art reference discloses, expressly or under principles of inherency, each and every element of a claimed invention. RCA Corp. v. Applied Digital Data Sys., Inc., 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984). Notwithstanding the disclosure therein that visibly transparent, heat reflective thermal control films can be used in conjunction with aircraft windows and that such films can be designed to prevent heat loss through a window, Russell does not actually teach, either expressly or under principles of inherency, the application of a heat-reflecting coating to the "interior" surface of an airplane cabin or any part thereof (including a window) as recited in independent claims 1, 18 and 20. Hence, we shall not sustain the standing 35 U.S.C. § 102(e) rejection of claims 1, 18 and 20, and dependent claims 2, 3, 15 and 17, as being anticipated by Russell.

Russell, however, clearly would have suggested the application of a heat-reflecting coating with a thermal emission coefficient no greater than approximately 0.5 to the interior surface of an airplane window. The requisite motivation lies in Russell's

disclosure that heat loss to and through the window of a vehicle such as an aircraft can be diminished by using a thermal control film or coating having a high degree of heat reflectivity. As an airplane window constitutes part of the airplane's cabin and the application thereto of such a coating would necessarily provide improved radiation exchange with a passenger in the cabin as compared to an uncoated window, Russell would have rendered obvious the subject matter recited in independent claim 1. Accordingly, we shall sustain the standing 35 U.S.C. § 103(a) rejection of claim 1, and independent claims 18 and 20 which stand or fall therewith, as being unpatentable over Russell.

Claim 2 depends from claim 1 and further defines the coating as being a transparent conductive coating. Russell's disclosure that transparent metal (i.e. conductive) thermal control films or coatings are a conventional, non-toxic, inexpensive and easily available choice as an optical coating for glazing applications (see column 3, line 66, through column 4, line 33) would have suggested the use of same to implement the above discussed application of a coating to the interior surface of an airplane window. Therefore, we shall sustain the standing 35 U.S.C. § 103(a) rejection of claim 2, and claim 3 which stands or falls therewith, as being unpatentable over Russell, as well as the

standing 35 U.S.C. § 103(a) rejection of claim 4, which also stands or falls with claim 2, as being unpatentable over Russell in view of Allemand.

Claim 5 depends from claim 1 and recites the step of selecting a coating thickness to achieve a desired thermal emission coefficient for the coating. As Russell discloses this step (see, for example, column 4, lines 19-33; column 10, lines 6-15; and column 23, line 36, through column 25, line 20), we shall sustain the standing 35 U.S.C. § 103(a) rejection of claim 5, and claim 6 which stands or falls therewith, as being unpatentable over Russell in view of Allemand.

Claim 7 depends from claim 1 and sets forth that the at least one interior surface of the airplane cabin comprises at least one window of transparent plastic material wherein the coating is applied to the at least one window. The above noted teachings of Russell considered together with the admission on page 8 of the appellants' specification that airplane windows "are normally made of a transparent plastic material" would have suggested this subject matter. Therefore, we shall sustain the standing 35 U.S.C. § 103(a) rejection of claim 7 as being unpatentable over Russell in view of Yoneda, the standing 35 U.S.C. § 103(a) rejection of claims 8 and 9, which stand or fall with claim 7, as being unpatentable

over Russell in view of Allemand and the standing 35 U.S.C. § 103(a) rejection of claim 8 as being unpatentable over Russell in view of Coleman.

Claim 10 depends from claim 1 and requires the at least one interior surface of the airplane cabin to comprise decorative plastic foil wherein the coating is applied to the decorative plastic foil. Russell, which as indicated above pertains to the application of thermal control films or coatings to glazings, would not have suggested a similar application to a decorative plastic foil in an airplane cabin. Rensch's disclosure of a decorative lighting laminate does not cure this deficiency. Thus, we shall not sustain the standing 35 U.S.C. § 103(a) rejection of claim 10, and dependent claims 11 and 12, as being unpatentable over Russell in view of Rensch.

Claim 15 depends from claim 1 and further defines the coating as having a thermal emission factor selected from the range of 0.1 to 0.3 inclusive. Russell's disclosure of conventional coatings having emissivities as low as 0.15 and of coatings having infrared radiation reflectivities of at least 90% would have suggested such a coating in the context claimed. Accordingly, we shall sustain the standing 35 U.S.C. § 103(a) rejection of claim 15 as being unpatentable over Russell.

Finally, we shall sustain the standing 35 U.S.C. § 103(a) rejection of dependent claim 17 as being unpatentable over Russell and the standing 35 U.S.C. § 103(a) rejection of dependent claims 16, 19, 21 and 22 as being unpatentable over Russell in view of Yoneda since the appellants have not challenged such with any reasonable specificity, thereby allowing these claims to stand or fall with parent independent claims 1, 18 and 20 (see In re Nielson, 816 F.2d 1567, 1572, 2 USPQ2d 1525, 1528 (Fed. Cir. 1987)).

SUMMARY

The decision of the examiner:

a) to reject claims 1-3, 15, 17, 18 and 20 under 35 U.S.C. § 102(e) as being anticipated by Russell is reversed;

b) to reject claims 1-3, 15, 17, 18 and 20 under 35 U.S.C. § 103(a) as being unpatentable over Russell is affirmed;

c) to reject claims 4-6, 8 and 9 under 35 U.S.C. § 103(a) as being unpatentable over Russell in view of Allemand is affirmed;

d) to reject claim 8 under 35 U.S.C. § 103(a) as being unpatentable over Russell in view of Coleman is affirmed;

e) to reject claims 7, 16, 19, 21 and 22 under 35 U.S.C. § 103(a) as being unpatentable over Russell in view of Yoneda is affirmed; and

f) to reject claims 10-12 under 35 U.S.C. § 103(a) as being unpatentable over Russell in view of Rensch is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv).

AFFIRMED-IN-PART

BRADLEY R. GARRIS Administrative Patent Judge	
JOHN P. McQUADE Administrative Patent Judge	BOARD OF PATENT APPEALS AND INTERFERENCES
JENNIFER D. BAHR Administrative Patent Judge	

JPM/ki

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